

latter numbers are given in the last column of Table IV. On the average these personal estimates of clear sky are lower than the sunshine as recorded by the self-registers.

COMPARISON OF RECORDS.

The duration of direct sunshine is the quantity shown by the self-recording photographic or thermometric sunshine registers; the percentage of area of clear sky is the quantity shown by the complement of the observer's estimate of cloudiness. It is sometimes assumed that these numbers should agree but, as has been explained in previous REVIEWS, the relation between these numbers is rather complex; in general, the monthly averages agree best in cloudy climates and may differ widely in clear climates. In the following table the instrumental record for April and the observer's estimate for April are brought together, side by side, and in accordance with the results of previous months it is seen that the instrumental percentages of duration of sunshine are almost always larger than the observer's personal estimates of percentages of area of clear sky:

Difference between instrumental and personal observations of sunshine.

Photographic stations.	Instrumental.	Personal.	Difference.	Thermometric stations.	Instrumental.	Personal.	Difference.
Tucson, Ariz.	86	78	8	Key West, Fla.	91	73	18
Santa Fe, N. Mex.	79	65	14	Colorado Springs, Colo.	70	61	9
San Francisco, Cal.	75	72	3	Vicksburg, Miss.	68	65	3
Dodge City, Kans.	74	69	5	Little Rock, Ark.	68	53	15
Savannah, Ga.	73	57	16	Baltimore, Md.	67	54	13
Denver, Colo.	68	56	12	Chicago, Ill.	64	51	13
Memphis, Tenn.	67	56	11	Wilmington, N.C.	63	64	-1
Kansas City, Mo.	61	54	7	Philadelphia, Pa.	62	50	12
Helena, Mont.	60	49	11	Salt Lake City, Utah	62	48	14
Galveston, Tex.	59	58	1	Columbus, Ohio	60	42	18
Washington, D. C.	57	56	1	New York, N. Y.	58	47	11
Cleveland, Ohio	57	47	10	Portland, Me.	58	39	19
Cincinnati, Ohio	56	50	6	New Haven, Conn.	57	48	9
Bismarck, N. Dak.	47	46	1	Rochester, N. Y.	56	51	5
Portland, Oreg.	37	33	4	Buffalo, N. Y.	56	47	9
San Diego, Cal.	60	.....	.....	Detroit, Mich.	55	45	10
Eastport, Me.	33	.....	.....	Des Moines, Iowa	52	46	6
				Boston, Mass.	51	42	9
				New Orleans, La.	.....	55	.....
				St. Louis, Mo.	.....	54	.....
				Louisville, Ky.	.....	.....	.....

NOTES BY THE EDITOR.

OBSERVATIONS AT HONOLULU, HAWAIIAN ISLANDS.

Meteorological observations at Honolulu, Hawaiian Islands, for April, 1894, by Curtis J. Lyons, Meteorologist to the Government Survey.

Date.	Barometer at sea level.			Temperature.					Humidity.			Wind.		Rain to 6 p. m.
	9 a. m.	3 p. m.	9 p. m.	6 a. m.	2 p. m.	9 p. m.	Minimum.	Maximum.	Relative.		Absolute.	Direction.	Force.	
									9 a. m.	9 p. m.				
1.....	Ins.	Ins.	Ins.	69	75	69	67	77	65	73	5.5	ne.	3	Ins.
2.....	30.20	30.12	30.18	62	70	71	61	78	64	72	5.8	e., ne.	3	0.00
3.....	30.18	30.11	30.18	68	75	65	65	78	66	73	5.9	ne.	3	0.00
4.....	30.17	30.09	30.16	68	76	67	63	79	65	79	6.1	ne.	3	0.01
5.....	30.14	30.06	30.15	68	76	67	63	80	62	76	6.1	se.	2	0.00
6.....	30.12	30.03	30.14	65	77	69	63	80	70	85	6.6	se.	3	0.00
7.....	30.12	30.07	30.15	67	78	68	63	79	70	80	6.6	s., s.	1	0.01
8.....	30.12	30.05	30.14	63	77	69	62	80	70	85	6.4	ne.	3	0.00
9.....	30.12	30.05	30.13	63	79	70	63	82	70	79	6.6	s.	3	0.00
10.....	30.14	30.08	30.13	71	78	73	68	80	63	70	6.3	ne.	3	0.02
11.....	30.12	30.05	30.12	72	77	71	71	79	66	77	6.0	ne.	3	0.01
12.....	30.10	30.03	30.12	72	77	71	71	79	66	77	6.1	ne.	4	0.00
13.....	30.08	30.06	30.16	71	74	72	71	78	75	75	6.3	ne.	5	0.10
14.....	30.17	30.10	30.14	70	75	72	70	79	65	74	6.3	ne.	5	0.06
15.....	30.15	30.06	30.10	71	76	71	70	78	62	73	6.1	ne.	4	0.06
16.....	30.08	30.00	30.07	68	76	71	67	79	66	70	6.1	ne.	4	0.14
17.....	30.08	30.00	30.07	79	77	70	67	79	66	75	6.1	ne.	4	0.12
18.....	30.10	30.04	30.11	70	75	71	68	77	73	77	6.4	ne.	4	0.26
19.....	30.11	30.01	30.08	68	75	72	68	75	80	77	7.0	ne.	5	0.26
20.....	30.07	30.04	30.12	72	76	72	71	78	77	79	6.8	ne.	5	0.18
21.....	30.15	30.13	30.18	71	75	72	70	77	75	70	6.5	ne.	4, 6	0.18
22.....	30.22	30.16	30.22	71	75	70	71	77	63	74	5.8	e., ne.	5	0.05
23.....	30.22	30.14	30.22	69	76	69	67	78	63	80	5.9	ne.	4	0.02
24.....	30.19	30.12	30.20	68	72	69	66	75	69	75	5.9	ne.	5	0.48
25.....	30.20	30.14	30.22	68	74	71	67	75	60	69	5.6	ne.	5	0.18
26.....	30.22	30.14	30.21	70	75	71	67	76	61	60	5.4	ne.	5	0.15
27.....	30.19	30.15	30.23	71	73	71	70	76	66	74	6.0	ne.	5	0.01
28.....	30.20	30.14	30.16	69	75	71	68	75	73	75	6.0	ne.	5	0.12
29.....	30.12	30.05	30.16	71	77	70	70	78	68	69	6.3	ne.	3, 0	0.05
30.....	30.14	30.10	30.16	68	73	72	66	81	77	84	7.1	ne., W.	2, 0	0.00
	30.14	30.05	30.14	70	79	72	68	81	77	79	7.1	sw.	1	0.02

Dark, overcast weather, but little rain at the end of April and the beginning of May. Hal at Hawaii 24th of April.

The barometer is corrected for temperature and reduced to sea level, but the gravity correction, -0.06, is still to be applied.

The absolute humidity is expressed in grains of water, per cubic foot, and is the average of four observations.

The rain is measured at 6 p. m., daily.

OBSERVATIONS IN ALASKA.

Mr. H. S. Tibbey, observer at Coal Harbor, Unga Island, Alaska, N. 55° 20' 45", W. 164° 38' 39", altitude 30 feet, sends the following notes with regard to special phenomena. The hours quoted by him are evidently local time, civil reckoning:

January 16, 7.10 a. m., slight shock of earthquake, vibrations northeast to southwest.

January 17, 3.45 a. m., slight shock of earthquake, vibrations northeast to southwest.

January 30, high wind commenced southerly early in the morning, rate 17

miles per hour, increased to 28 and reached 72 miles from 4 to 6 p. m. Hauled to southwest, blowing 33 miles till 2 p. m., next day, when it gradually abated to a gentle breeze.

February 8, 4 p. m., wind from northwest, increased to 37 miles per hour. Barometer having risen rapidly to 30.50, began falling rapidly. Wind culminated between 8 and 9 a. m. on the 9th, blowing 60 miles per hour; then shifted to north-northeast and northeast, gradually decreasing to 35 and 23 miles; hauled to the northwest and became normal. Barometer stopped falling at 29.44, at 2 p. m., 9th. During the disturbance, as soon as the wind left the northwest, the thermometer jumped from 6° to 29°, and continued fluctuating until the wind settled back again to the northwest.

March 17, during the daytime it was almost calm; at about 9 p. m. the wind shifted from southwest to southeast, freshened rapidly, increasing during the night from 15 miles per hour until noon of the 18th, when it culminated at 90 miles per hour, accompanied by light showers, fine snow, and occasional hail. By 4 p. m., wind velocity declined to 40 miles per hour; hauling, meanwhile, to southwest and blowing in squalls, with fine snow; averaged 20 miles per hour till 8 a. m., of the 19th, when it passed more to the westerly and became normal. The barometer fell from 30.07, at 2 p. m., 17th, to 29.40 at 7 a. m., 18th, when it commenced to rise and reached 29.98 at 7 a. m., 19th. Thermometer fluctuated from 35° to 12° during the storm.

RAINFALL IN TEXAS.

Rainfall observed near Golinda, Falls Co., Tex., by Mr. E. G. Hanrick.

(Approximate location, N. 31° 20' W. 99°; altitude, 500 feet.)

Month.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
January.....	0.50	11.00	1.75	1.25	6.20	1.75	0.00	2.90	6.75	2.75	6.90	1.90	1.00
February.....	3.75	7.10	3.50	2.75	0.70	3.50	0.00	5.25	5.20	2.50	1.15	1.50	0.65
March.....	1.25	4.10	5.25	1.10	2.40	1.50	0.00	4.70	0.60	5.15	1.00	2.55	3.40
April.....	3.25	1.00	0.25	8.85	5.50	5.10	1.90	3.95	2.10	7.55	7.00	1.50	3.00
May.....	3.00	6.00	0.25	9.50	12.25	0.10	3.60	4.10	3.20	5.50	0.30	4.05	4.50
June.....	0.00	0.00	2.75	0.35	2.00	2.00	1.05	3.95	8.25	3.10	2.10	1.05	0.40
July.....	1.50	6.50	2.60	1.35	1.50	2.75	1.20	2.00	0.80	1.85	1.35	0.90	1.00
August.....	3.50	4.00	0.00	0.00	0.10	0.55	2.35	5.75	1.10	1.60	3.50	4.00	3.15
September.....	4.50	5.50	1.00	0.75	5.95	6.50	2.50	1.00	5.80	5.20	0.80	0.20	0.50
October.....	9.75	5.50	0.50	3.75	1.50	1.00	1.80	2.25	4.00	5.10	0.60	3.20	0.00
November.....	2.75	6.50	1.35	1.90	1.50	1.20	3.00	5.85	4.95	2.90	2.50	1.80	3.95
December.....	2.25	0.00	2.50	3.50	2.25	0.00	2.05	4.30	0.00	0.25	5.15	5.20	0.60
Total.....	36.00	57.20	21.70	35.05	41.85	25.95	20.05	46.00	39.15	43.45	32.35	29.05	22.15

General average of 13 years, 34.61 inches annually.

THE WEIGHT OF SNOW.

In connection with the heavy snowfall of April 10 and 14, in Pennsylvania, a correspondent records the fact that at Nittany, in central Pennsylvania, N. 41°, W. 77° 40', the amount of snow that fell on the platform scales at that place weighed 1,640 pounds; as the platform was 8 by 12 feet, or 96 square feet in area, this gives an average weight of about 17 pounds to a square foot, which is equivalent to a depth of 3.3 inches of water, and using the ordinary ratio, 10, this gives a corresponding depth of 33 inches of snow.

Mr. Edward Ferry, of Bel Air, Harford Co., Md., in a letter published in the monthly report of the Maryland State Weather Service, states that his clerk found that the weight of the snow on the platform scales at that place was 1,520 pounds (presumably on the morning of the 12th of April); the scale platform measured 7 feet 10 inches by 15 feet; this gives an average of 12.93 pounds to the square foot, and, if we assume that none of the snow melted, and so escaped being weighed, this would correspond to a depth of 2.4 inches of water. The average depth of snow lying on the ground at the end of the great snowstorm of April 10 and 11, in northern Maryland, varied from 15 to 30 inches in the different localities covered by newspaper reports, but the largest recorded by regular observers was 24 inches at Darlington and at Fallston, both in Harford County, at the head of Chesapeake Bay.

Although the above result may be rather crude, yet it suggests an excellent method of getting at the average quantity of precipitation in case the snow falls without melting and without much drifting. It also gives some idea of the weight that must be supported by roofs and walls in cases of similar heavy snowfalls.

THE BEAUFORT WIND SCALE AS USED AT SEA.

One of the best series of observations for the purpose of converting the 0 to 12 scale of Admiral Beaufort into wind velocities, as measured by anemometers, is that made in the years 1874-'76, on H. M. S. *Gazelle*, of the German Navy, under the command of Capt. von Schleinitz. During these years there were opportunities for measuring velocities as high as 11 of the Beaufort scale; 3,386 observations were recorded. The anemometer was a so-called portable instru-

ment made by Krafft; the diameter of the circle described by the cups was 29 centimeters, and it has been assumed that the Robinson anemometer factor, 3, holds good for this instrument. The estimated wind force, as recorded by the officers of the *Gazelle*, seems to accord very closely with the estimates by experienced observers on the German coast. The highest winds recorded in connection with the hurricane at Mauritius, April 29, 1892, and at Manila, October 20, 1882, were 50 and 54 meters per second, respectively, by large Robinson anemometers, for which the factor 3 is assumed, and, therefore, 50 is adopted as appropriate to the figure 12 on the Beaufort scale. The German naval ship *Elizabeth*, during 1877, in the northwest part of the Pacific Ocean, experienced four severe storms, and the results of 131 measurements give another set of conversions from the Beaufort to the absolute scale. The results of the observations on both the *Elizabeth* and the *Gazelle* are given in the following table:

Beaufort scale.	Meters per second.		Miles per hour.	
	<i>Gazelle</i> .	<i>Elizabeth</i> .	<i>Gazelle</i> .	<i>Elizabeth</i> .
0	0.0	0.0	0.0	0.0
1	1.0	1.5	2.2	3.4
2	2.0	3.0	4.5	6.7
3	4.0	4.5	8.9	10.1
4	6.0	7.0	13.4	15.7
5	8.0	8.5	17.9	19.0
6	10.5	10.5	23.5	23.5
7	13.0	13.5	29.1	30.2
8	16.0	16.5	35.8	36.9
9	20.0	20.0	44.7	44.7
10	25.0	25.0	55.9	55.9
11	32.5	.....	72.7	.....
12	(50.0)	.....	(111.8)	.....

METEOROLOGICAL TABLES.

[Prepared by the Division of Records and Meteorological Data.]

The following pages present in tabular form the climatological data for the current month, on which the text of the preceding part of this REVIEW has, to a large extent, been based.

For a detailed description of the methods of observation, compilation, and computation relating to these tables, the reader is referred to page 129 of the MONTHLY WEATHER REVIEW for March, 1894. The general contents of the tables are as follows:

Table I gives for 140 Weather Bureau stations, making two observations daily, and for 10 others making only one observation, the ordinary climatological data.

Table II gives for about 2,200 stations, occupied by voluntary observers, the mean and extreme temperatures and the total precipitation.

Table III gives for about 30 Canadian stations the climatological data.

Table IV gives for 36 Weather Bureau stations the percentages of sunshine for each hour of local mean time.

Table V gives for 79 stations the mean temperatures for each hour of seventy-fifth meridian time.

Table VI gives for 68 stations the mean pressures for each hour of seventy-fifth meridian time.

Table VII gives for 142 stations the mean hourly movement of the wind.

Table VIII gives for 68 stations the resultant movements and directions of the wind from continuous registrations.

Table IX gives for 140 stations the component and resultant directions based on simultaneous observations at 8 a. m. and 8 p. m., seventy-fifth meridian time.